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10/660,054

09/11/2003

Shigeru Yamane

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EXAMINER

LAM, CATHY FONG FONG

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

06/02/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/660,054 | <b>Applicant(s)</b><br>YAMANE ET AL. |  |
|                              | <b>Examiner</b><br>Cathy Lam         | <b>Art Unit</b><br>1794              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 March 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 37,40,59,76,84-87 and 96-105 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37,40,59,76,84-87 and 96-105 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 26, 2009 has been entered.

In view of the amendment and remarks filed on March 26, 2009, the previous art rejections have been withdrawn. The pending claims however continue to be unpatentable as following:

#### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on Oct 16, 2000. It is noted, however, that applicant has not filed a certified copy of the 2000-314861 application as required by 35 U.S.C. 119(b).

#### ***Drawings***

3. Figures 5-7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

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applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

4. Claims 40, 76, 85, 99-100 and 102-103 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 40 and 85, it is unclear whether these densities are the overall average density for the inner layer and the two surface layers?

In claim 76, it is vague and indefinite as to what material(s) are “first and second layers” referring to?

In claims 99-100 and 102-103,  $700 \text{ kg/m}^3$  could be the density for *both* inner layer and the surface layers. The examiner is taking the position that such density can be an average density for both the inside layer and the two surface layers.

***Claim Rejections - 35 USC § 103***

5. Claims 37, 40, 59, 76, 84-87, 96-105 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nakatani (US 5888627) or Haas et al (US 6245696).

Nakatani discloses a printed circuit board comprised of a prepreg (100), a plurality of through holes (103), resin layers (101), release layers (102), conductive paste (104) and wiring patterns (106) (Figs. 1A-1G).

The prepreg is comprised of a non-woven fabric and a thermosetting resin. The non-woven fabric is aramid fibers and the thermosetting resin is epoxy resin (col 8 L 47-

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50 & L 56-59). The epoxy resin is in uncured stage and is on both surfaces of the non-woven fabric (col 3 L 28-30). A pair of cover films (or release layers) (102) are formed onto both sides of the prepreg (col 4 L 5-9).

Through holes (103) are formed in the prepreg in the thickness direction, then electroconductive paste (104) is filled into the through holes. The cover films are then removed. Conductive Films are formed onto both surfaces of the prepreg, subsequently to form circuit patterns (col 4 L 10-15).

The non-woven aramid fabric in the prepreg has a density of  $0.8 \text{ g/cm}^3$  or above, it is equivalent to  $800 \text{ kg/m}^3$  or above (col 3 L 52-64).

Haas also discloses a bond ply material which is useful for printed wiring boards. The bond ply is comprised of a core (18), resin layers (20 & 22), release films (17), via holes (10) and conductive paste (12).

The core (18) is comprised of *at least one* non-woven reinforcing material (16) and at least one resin layer (14) (col 3 L 37-42). Two b-stage resin layers (20 & 22) are formed onto both surfaces of the core (18) (col 4 L 10-13). The non-woven reinforcing material (16) can be organic fibers such as polyaramids and the resin material for the resin layers can be epoxies (col 6 L 2-4 & col 7 L 14-15). The bond ply material consists of about 45-95 wt% of resin and about 5-55 wt% reinforcing material (col 3 L 55-58).

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The release films (17) were used to cover (or protect) the surfaces of the bond ply sheets (col 3 L 42-45). Circuit layers (50 & 54) are formed onto the surfaces of the bond ply after the release films (17) are removed (Fig. 2a, col 5 L 10-16).

Both Nakatani and Haas teach the same invention as applicant's, but it does not teach the reinforcement fabric consists of three layers and with different densities.

In view of the prior art teachings, one skill in the art would choose more than one fabric layer for the core and to choose a desired density of the fabric because Haas clearly teaches at least one non-woven reinforcing material (16) could be used in the core (18), and the reinforcing material (16) and the resin amount falls within the claimed range (col 3 L 39-42 & L 55-58); and Nakatani teaches the density of the non-woven fabric to be  $0.8 \text{ g/cm}^3$  (or  $800 \text{ kg/m}^3$ ) or above (col 3 L 59-61).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cathy Lam whose telephone number is (571) 272-1538. The examiner can normally be reached on 9am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cathy Lam/  
Primary Examiner, Art Unit 1794